STANLEY SCHOOL (PWS 7190053)
SOURCE WATER ASSESSMENT FINAL REPORT

August 21, 2001

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the Stanley School well*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Stanley School drinking water system consists of one groundwater well that serves approximately 40 people with 1 connection. A review of the Idaho Drinking Water Information Management System (DWIMS) provided water quality information for the Stanley School well.

In January 1996, the inorganic compound (IOC) lead was detected in the Stanley School well water at a concentration of 0.006 milligrams per liter (mg/l). The Maximum Contaminant Level (MCL) for lead is 0.015 mg/l. Nitrate concentrations ranging from 0.3 mg/l to 0.42 mg/l were also detected from January 1996 to February 2001. The MCL for nitrate is 10 mg/l. No volatile organic compounds (VOCs), synthetic organic compounds (SOCs), or microbial contaminants (i.e. bacteria) were detected in the well . In terms of total susceptibility, the Stanley School well water rated medium for IOCs, VOCs, SOCs, and microbial contaminants. This is due to several factors within the delineated area: the well-drained nature of the soil, shallow depth to water, and the absence of at least a 50 foot thickness of a low permeability layer.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Currently, the Stanley School faces no serious source water quality issues. The reported concentrations of lead and nitrates in the well water are below the MCL for both IOCs. If levels of lead or nitrates increase in the well water, the Stanley School should investigate various systems like ion exchange, reverse osmosis, or activated alumina that could be used to treat these problems. No significant potential contaminant sources currently exist within the source water assessment area for the Stanley School well. Practices aimed at reducing the amounts of manure and agricultural chemicals applied to farmland, and their potential for leaching into designated source water areas should be implemented. Most of the designated area is outside the direct jurisdiction of Stanley School. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State

Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR STANLEY SCHOOL, STANLEY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Stanley School well is a non-transient groundwater well serving approximately 40 people with 1 connection, located one tenth of a mile south of Stanley, Idaho in Custer County (Figure 1). The public drinking water system for the Stanley School is comprised of one groundwater well.

There are no significant water quality issues currently facing the Stanley School well. In January 1996 lead was detect in the well had a concentration at 40% of the MCL for lead. The highest nitrate concentration, detected in the well in January 1996, is only 4% of the MCL for nitrate.

Defining the Zones of Contribution--Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. Washington Group, International used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time-of-travel (TOT) for water associated with the Sawtooth Valley–Bear Valley hydrologic province. The computer model used site- specific data, assimilated by Washington Group, International from a variety of sources including published reports and local area well logs. The delineated source water assessment area for the Stanley School well can best be described as a corridor 0.2-mile wide at the wellhead and 0.95-mile wide at the extent of the delineated capture zone, 1.7 miles to the southwest.

The Sawtooth Valley–Bear Valley basin occupies approximately 220 square miles north of Sun Valley. The basin is an elongated, northwest to southeast trending intermontane valley that is drained by the Salmon River and its tributaries. The elevation of the valley floor at Stanley is approximately 6,300 feet above mean sea level (msl). The basin is bounded on the west by the Sawtooth Mountains and on the east by the Salmon River Mountains. Unconsolidated Quaternary alluvium and glacial moraine make up the valley-fill (Chaote, 1962 map, and Kern, 1959, p. 4). The Cretaceous Idaho batholith forms the basement rock. Precipitation averages 16 inches annually, falling mostly in the winter months as snow (Kern, 1959, p. 2). Briar et al. (1996) shows ground-water movement to the northeast, toward the confluence of Valley Creek and the Salmon River.

The Stanley School well log indicates the water-producing zone is decomposed granite. A 20-foot-thick layer of clay and granitic sand (170 to 190 ft-below ground surface [bgs]) and 35 feet of yellow clay (135 to 170 ft-bgs) overlie the water-bearing unit. The specific capacity (amount of water the well produces in a minute per foot of water table drawn down) of the well is 1 gal/min/ft, based on well test data presented in the well log.

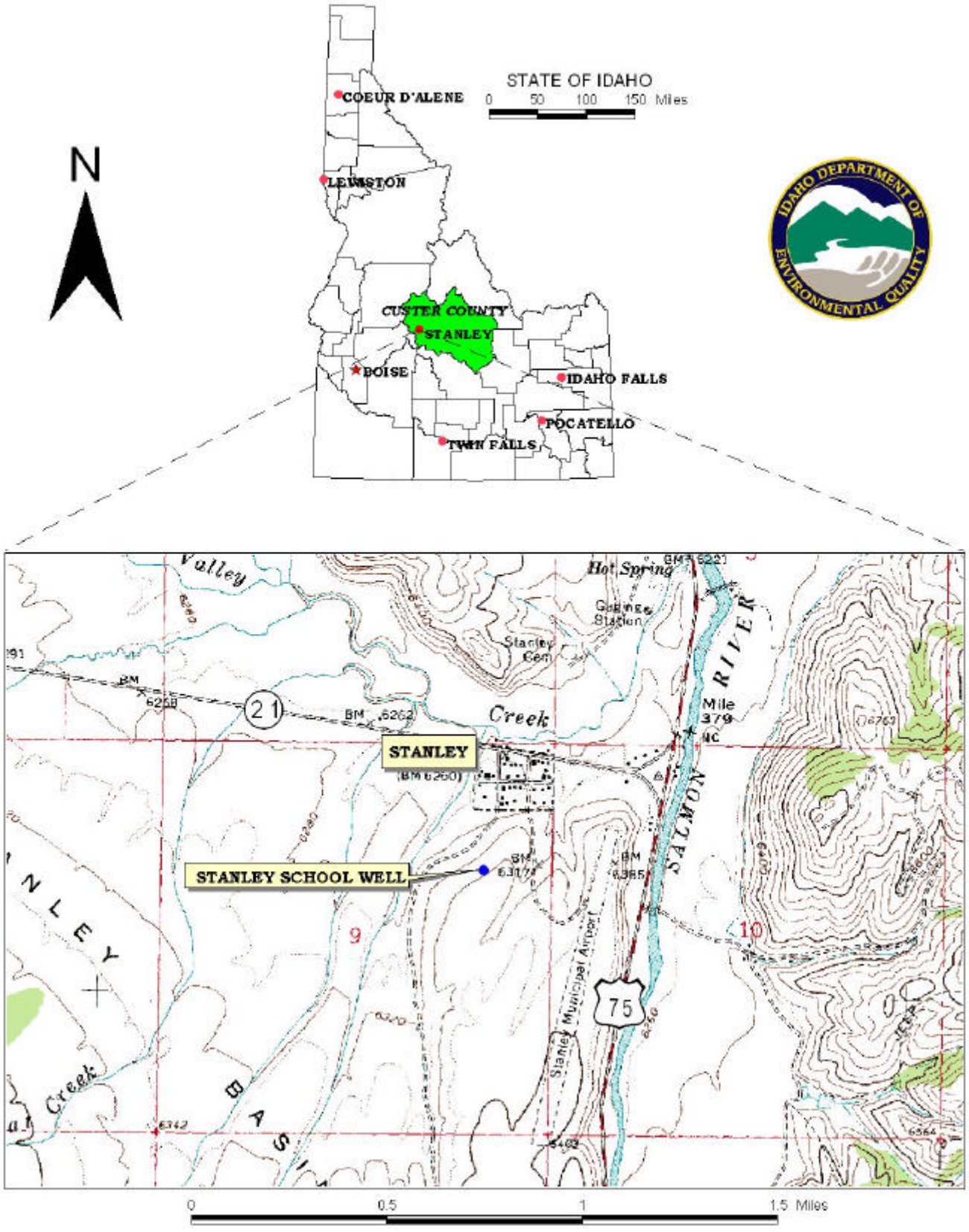
The actual data used by Washington Group, International in determining the source water assessment delineation area are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside of the Stanley School well delineation is a combination of disturbed and undisturbed undeveloped land, residential and commercial property, agriculture, and National Forrest land. Land use within the immediate area of the wellhead consists of disturbed and undisturbed undeveloped land, and agriculture.

FIGURE 1. Geographic Location of the Stanley School



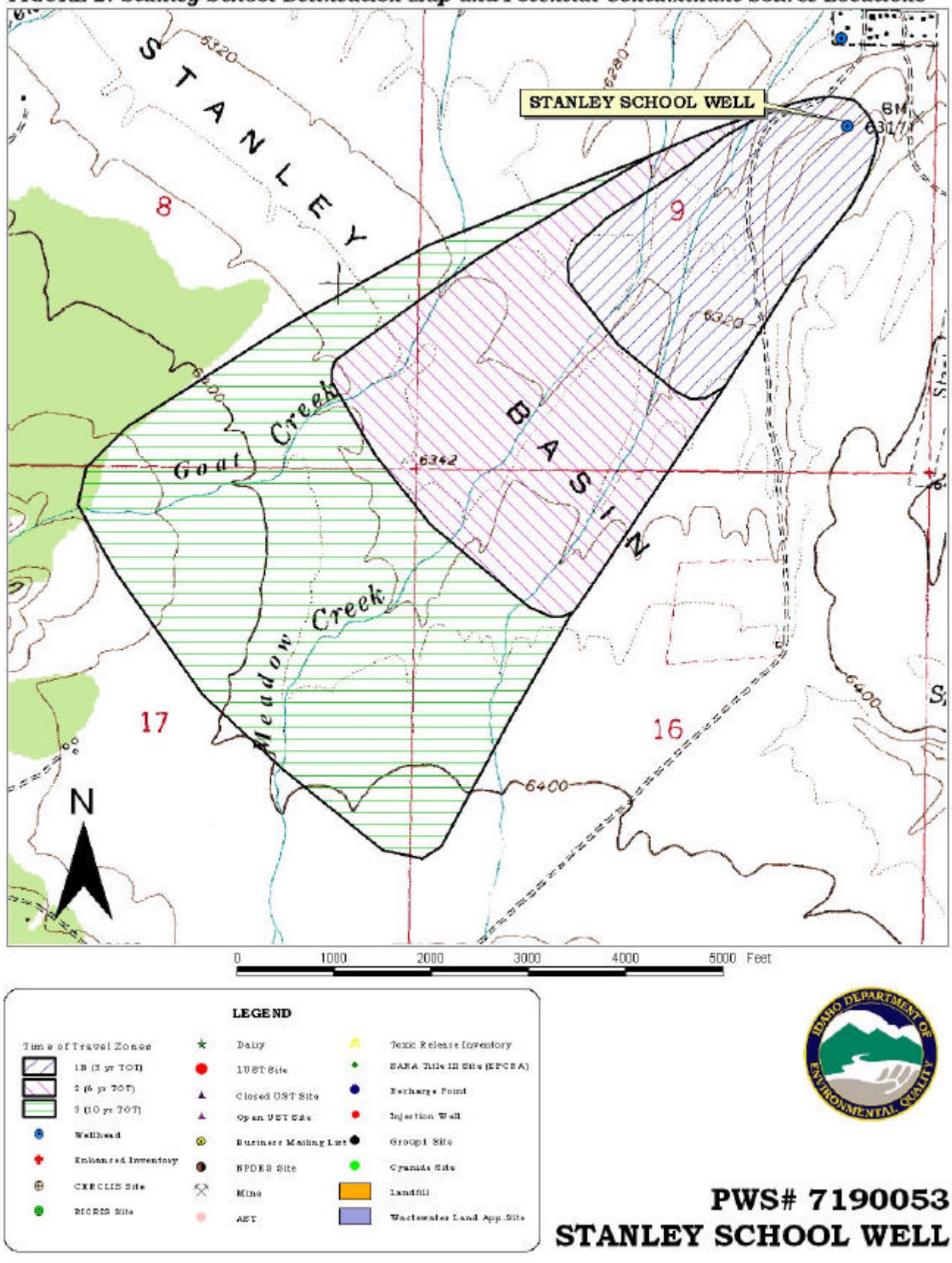
It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted during March of 2001. This involved identifying and documenting potential contaminant sources within the Stanley School Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ.

There are no significant potential sources of contamination for the Stanley School well. The Stanley School should carefully monitor development within the delineated source water assessment area and identify any potential contaminant sources that may develop in the future.

FIGURE 2. Stanley School Delineation Map and Potential Contaminant Source Locations



PWS# 7190053
STANLEY SCHOOL WELL

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity was high for the well (see Table 1). This reflects the well-drained soils in the area and a vadose zone (zone from land surface to the water table) composed of sand and gravel, which facilitates downward movement of contaminants. The well does not have the requisite 50 feet cumulative low permeability formations and has a shallow depth to groundwater which also contributes to the high score.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The Stanley School drinking water system consists of one well that extracts ground water for domestic uses. The well system construction score was moderate (Table 1) for the well, primarily because the well casing and annular seal do not extend to a low permeability layer. Also, the main producing zone is less than 100 feet below the static water level making the production zone susceptible to downward migrating contaminants. The well meets current Idaho Department of Water Resources *Well Construction Standards and Rules*.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. According to the 2000 Sanitary Survey, the Stanley School well is in substantial compliance with current standards.

Based on water chemistry data and local area well logs, the Stanley School well is in the upper, unconfined aquifer.

Potential Contaminant Source and Land Use

The well rated low for IOCs (i.e. arsenic, nitrate), VOCs (i.e. petroleum products), SOCs (i.e. pesticides), and microbial contaminants (i.e. bacteria). Countywide agricultural land use is moderate, and there are no significant potential contaminant sources identified in the delineated source water assessment area for the Stanley School well. Potential sources of contamination could exist in the future as the area within the delineated capture zone is developed.

Final Susceptibility Rating

Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. The Stanley School well scored high for hydrologic sensitivity and moderate for well construction. Having no potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and less than 50% agricultural land contributes to the overall ranking as well. In terms of total susceptibility, the well rates moderate for IOCs, VOCs, SOCs, and microbial contaminants.

Table 1. Summary of Stanley School Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	H	L	L	L	L	M	M	M	M	M

[1]**H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,**
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, the Stanley School well water rated moderate for IOCs, VOCs, SOCs, and microbial contaminants mainly due to the well drained soils in the area, shallow depth to water, composition of the vadose zone, and the fact that the well casing does not extend into a low permeability unit. The Stanley School well faces no significant water quality issues at the time of this report, nor do any significant potential sources of contamination exist within the source water assessment area.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. Currently, the Stanley School faces no serious source water quality issues. The reported concentrations of lead and nitrates in the well water are below the MCL for both IOCs. If levels of lead or nitrates increase in the well water, the Stanley School should investigate various systems like ion exchange, reverse osmosis, or activated alumina that could be used to treat these problems. Although no significant potential sources of contamination currently exist in the delineated source water assessment area for the Stanley School well, development in the area should be closely monitored. Practices aimed at reducing the amounts of manure and agricultural chemicals applied to farmland, and their potential for leaching into designated source water areas should be implemented.

Most of the designated areas are outside the direct jurisdiction of Stanley School. Partnerships with state and local agricultural agencies and industry groups should be established and are critical to the success of a source water protection program. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

Since the aquifer appears to have alternating layers of clays and sands, a deeper well could be installed to offer better protection from inorganic contaminants for the Stanley School well. Any new PWS well should meet the *Recommended Standards for Water Works* (1997) as outlined in IDAPA 37.03.09 and IDAPA 58.01.08.550. Water should be taken from beneath a confining clay layer since the upper aquifer has a higher potential for becoming contaminated.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office	(208) 528-2650
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

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Attachment A

Stanley School
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : STANLEY SCHOOL Well# : WELL #1 Public Water System Number 7190053 5/1/01 4:55:23 PM

1. System Construction		SCORE				
Drill Date		8/25/77				
Driller Log Available		YES				
Sanitary Survey (if yes, indicate date of last survey)		YES	1998			
Well meets IDWR construction standards		NO	1			
Wellhead and surface seal maintained		YES	0			
Casing and annular seal extend to low permeability unit		NO	2			
Highest production 100 feet below static water level		NO	1			
Well located outside the 100 year flood plain		YES	0			
Total System Construction Score			4			
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained		NO	2			
Vadose zone composed of gravel, fractured rock or unknown		YES	1			
Depth to first water > 300 feet		NO	1			
Aquitard present with > 50 feet cumulative thickness		NO	2			
Total Hydrologic Score			6			
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE		1	1	1	1
Farm chemical use high		NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A		NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A			1	1	1	1
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)		NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum			0	0	0	0
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
4 Points Maximum			0	0	0	
Zone 1B contains or intercepts a Group 1 Area		NO	0	0	0	0
Land use Zone 1B	25 to 50% Non-Irrigated Agricultural Land		1	1	1	1
Total Potential Contaminant Source / Land Use Score - Zone 1B			1	1	1	1
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present		NO	0	0	0	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Land Use Zone II	25 to 50% Irrigated Agricultural Land		1	1	1	
Potential Contaminant Source / Land Use Score - Zone II			1	1	1	0
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present		NO	0	0	0	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of		NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III			0	0	0	0
Cumulative Potential Contaminant / Land Use Score			3	3	3	2
4. Final Susceptibility Source Score			11	11	11	11
5. Final Well Ranking			Moderate	Moderate	Moderate	Moderate